

3D Printing For the Help of Farmers

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Introduction

India is largely an agricultural country with a variety of conventional methods involved in food manufacturing processes. Though these methods have their own advantage but we cannot rely on them in this modern era. This is where 3D printing comes into the picture and aims to bring a revolution in the food industry. It is a technique that is not only employed in food industry but has been used in agriculture, machines and pharmaceutical industry for a long time now. This article majorly focuses on uses of 3D printing in agriculture and specifically it's helpful application within farmers.

What is 3D Printing?

3D printing refers to an advanced technique which works by deposition of materials layer-by-layer. For this reason, it is also being referred to as Food Layer Manufacturing technique. Since, it is a digital concept it requires less or no human interaction in between which further depicts its accuracy. It is a technique which has been in use for a decade now but still it leaves us unaware with a wide number of applications it provides. It can be used in fabricating or designing the food with various colours, shapes and texture along with a special application in penetration of a food additive to the material. By modifying the nutritional content of the food, it gives the consumers a great experience with a combination of both nutrition and health.

3D printing and Farmers

What a teacher is to education system is what farmers are to agriculture in India. They are believed to run and change the agricultural concept for better. Modern agriculture has definitely laid down an easy road for farmers as compared to traditional way of farming. But that is not enough! Modern agriculture must be a sustainable one so that it not only favours our farmers but also aid in environment protection. Most of the manual work might have been taken over by machinery and tools but they also impose a number of challenges to the

farmers. First of all, they are way too expensive for them. Even if they manage to buy expensive machinery the cost and maintenance adds to the expenses making it a difficult approach. Secondly, if a farmer is using an equipment for a long time, there might be chances that there parts might not be available for replacement. Not only this, agricultural produce has slowed down over a period of time due to various climatic changes. There is a need to increase the yield by using less energy and that too in a sustainable way.

Advancements in science and technology have come to a rescue for all these problems. It works in a different way and involves the use of various technologies including machines, devices, sensors and even robots. 3D printing is one such technology that aids in agricultural development and hence a helping hand to farmers. It has been gaining an increasing attention for its wide applications in this area. It is mainly employed in manufacturing of various tools and machinery in the field of agriculture. 3D printed parts of the tools are usually incorporated with the parts manufactured conventionally to make up the fruit picker, shovel and handle useful for urban farming. Thermoplastics are the most commonly used material for this purpose. Their low cost, biodegradable and recyclable nature makes it a straight forward way in 3D printing. Various irrigation equipments like sprinklers and garden hoses are also being manufactured as shown below.



Fig. 1 A sprinkler with more water Capacity- used for crops like potato etc. water



Fig. 2 This modified design of a garden Hose allows the multidirectional flow of water

A brief about the applications of 3D printing for the help of farmers is given below:

3D printed parts	Application
Fruit picker	Urban farming
Gear	Spare part

Sprinkler	Irrigation
Spigot	Water Management
Packer bottom	Testing equipment

Not only this, 3D printing has also been employed to manufacture the spare parts of the machinery and tools used. Being able to manufacture the replacement parts would solve many problems of farmers. This technology tends to save both time and money. Besides this, some other products include 3D printed Drones, chicken feed holders and corn-shellers which are used in Animal food management as well. A pictorial representation of these can be shown as:



3D printed drone

3D printed corn shellers

3D printed chicken feed holder

3D printed drones find its use in performing pest control by spraying it effectively and uniformly over the field. Besides this, small scale farming and gardening can also be benefitted from 3D printing. It will motivate farmers and to-be-farmers for an agricultural start-up and also enable them to produce some parts through this technology without worrying about huge initial expenses. Thus, it helps in generating employment in a sustainable and efficient way.

Conclusion

3D printing is the face of future technology and it not only favours agricultural advancements but also brings about an entrepreneurial spirit among people. Be it food products or agricultural tools, it aims at minimising the waste produce, thereby promoting sustainability. As already discussed, it has a number of advantages over other methods but its limitations cannot be overlooked. Since, it is operated and does not involve the manual work;

it needs to be formulated well. The food ingredients and size of the nozzle are some of the factors to be taken into consideration to allow an undisturbed experience. Farmers are said to be the primary beneficiaries of this technology, hence more research must be done to increase the efficiency and quality of the materials produced. This takeover of agricultural advancement is definitely going to benefit the food value chain.

References

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